

# RF Exposure Evaluation

## FCC ID: 2AAZR-HSD8033

### 1. Client Information

<b>Applicant</b>	: Shenzhen Highstar Electrical Co., Ltd
<b>Address</b>	: 2F&4F, Building 6, Highstar Industrial zone, Gangtou, Bantian Street, Longgang District, Shenzhen, China
<b>Manufacturer</b>	: Shenzhen Highstar Electrical Co., Ltd
<b>Address</b>	: 2F&4F, Building 6, Highstar Industrial zone, Gangtou, Bantian Street, Longgang District, Shenzhen, China

### 2. General Description of EUT

<b>EUT Name</b>	: MINI BLUETOOTH SPEAKER WITH FAN	
<b>Models No.</b>	: HSD8033A, HSD8033B, HSD8033C	
<b>Model Difference</b>	: All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.	
<b>Product Description</b>	Operation Frequency:	Bluetooth 2.1+EDR: 2402~2480 MHz
	Number of Channel:	Bluetooth: 79 Channels See Note 2
	Max Peak Output Power:	Bluetooth: -1.486 dBm( $\pi$ /4-DQPSK)
	Antenna Gain:	0 dBi PCB Antenna
	Modulation Type:	GFSK (1 Mbps) $\pi$ /4-DQPSK (2 Mbps)
<b>Power Supply</b>	: DC Voltage supplied by USB. DC Voltage supplied by Li-ion battery.	
<b>Power Rating</b>	: DC 5V by USB Cable. DC 3.7V by 2200mAh Li-ion battery.	
<b>Connecting I/O Port(S)</b>	: Please refer to the User's Manual	

**Note:** More test information about the EUT please refer the RF Test Report.

## SAR Test Exclusion Calculations

1. FCC: According to KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.

(1) Clause 4.3: General SAR test reduction and exclusion guidance

Sub clause 4.31: Standalone SAR test exclusion considerations

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6GHz at test separation distance  $\leq 5$  mm are determined by:

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation, mm})] * [\sqrt{f_{\text{GHz}}]} \leq 3.0 \text{ for 1-g SAR}$$

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation, mm})] * [\sqrt{f_{\text{GHz}}]} \leq 7.5.0 \text{ for 10-g SAR}$$

## 2.

**Calculation:**

Test separation: 5mm						
Bluetooth Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-2.815	-2±1	-1	0.794	0.246	3.0
2.441	-2.613	-2±1	-1	0.794	0.248	3.0
2.480	-2.293	-2±1	-1	0.794	0.250	3.0
Bluetooth Mode ( $\pi/4$ -DQPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-1.859	-2±1	-1	0.794	0.246	3.0
2.441	-1.642	-2±1	-1	0.794	0.248	3.0
2.480	-1.486	-2±1	-1	0.794	0.250	3.0

So standalone SAR measurements are not required.

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